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# Socio-economic differences in prescription and OTC drug use in Dutch adolescents

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## Key words

Adolescent  
Drug-utilisation  
Gender  
OTC drugs  
Prescription drugs  
Socio-economic factors  
The Netherlands

## Abstract

**Objective:** To detect whether there were socio-economic differences in the overall use of prescription and OTC drugs among adolescents.

**Methods:** This study was a secondary analysis of questionnaire data collected to investigate socio-economic differences in health risk behaviour and decision-making.

**Results:** About 20% of the 741 girls and 10% of the 736 boys reported using at least one prescription drug in the past 14 days, oral contraceptives excluded. For OTC drugs these percentages were 45% and 24%, respectively. No statistically significant socio-economic differences in prescription drug use could be detected. A higher socio-economic status was associated with an increased OTC drug use, especially in boys. The odds of girls who reported medication was about twice that for boys, after adjusting for perceived health and socio-economic status.

**Conclusion:** There were socio-economic differences with regard to OTC drug use. No socio-economic differences in prescription medication use could be found. There were gender differences with respect to medication use in adolescence, regardless of perceived health and socio-economic status.

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## Introduction

Social inequalities in health continue to be an important problem in many European countries. In the past, the social inequalities in health services access and health services consumption have been a major point of interest. Partially due to increasing attention for the health of ethnic and religious minorities, socio-economic health differences remain of interest<sup>1,2</sup>. The increasing health differences within and between former communist countries also remind one of the impact of social environment<sup>3</sup>.

Research from different countries suggests that the association between socio-economic status and health is modified by age. Health differences associated with socio-economic status exist at birth and decrease during childhood<sup>4–6</sup>. According to the international literature, social inequalities in health are eminent in adulthood<sup>3,4</sup>. Adolescence, in contrast, seems better characterised by the almost absence of socio-economic health differences<sup>6,7</sup>.

Several Swedish studies investigated the association between prescription drug use and socio-economic status<sup>8–10</sup>, but none of these studies looked into the association between socio-economic status and overall medical drug use in adolescence.

In this paper, the association between socio-economic status and drug use of adolescents in The Netherlands is investigated. For both prescription and OTC (non-Rx) medication, the associations between overall medical drug consumption and socio-economic status is investigated, with and without taking into account gender and perceived health.

## Materials and methods

### Data collection

This study was a secondary analysis of data collected to investigate social inequalities in health risk behaviour and decision-making styles<sup>11,12</sup>. For this project, 4th grade scholars from 18 secondary schools in the north of the Netherlands filled out a questionnaire at the end of 1994/early 1995. In the Netherlands, the age of fourth grade scholars ranges from 14 to 21 years, resulting from skipping classes in primary school and changing from one type of school to another. The median age of fourth grade scholars is 16 years. The response rate was 95%, yielding 1984 respondents. 1598 of these respondents were aged 15–17 and had answered the following question on drug use: 'Did you use any prescription drug (prescribed by a medical doctor or dentist) during the past 14 days, excluding oral contraceptives?' OTC drugs were inquired after similarly: 'Did you use any non-prescription drug during the past 14 days?'. After exclusion of respondents with incomplete information (in all cases on socio-economic status) a sample of 1477 adolescents remained (1477/1598 or 92% of the respondents aged 15–17).

Socio-economic status (SES) was operationalised as the highest attained educational level of the parents since education has been reported to be a better socio-economic indicator than income or occupation of the head of the household<sup>13,14</sup>. Six levels of SES were distinguished, ranking from low (primary education) to high (university). The respondents rated their health as bad, moderate, good, very good or excellent on the question 'How do you experience your health?' Because of their rare occurrence, the categories 'bad' and 'moderate' were collapsed in the analyses.

### Statistical analysis

Associations were investigated using chi-square tests; linear associations were investigated by means of chi-square tests for linear trend. These tests were considered significant at the  $P < 0.05$  level.

To obtain adjusted odds ratios, logistic regression models were used. For the logistic regression, socio-

economic status was reclassified into lower, middle and upper class, based on years of secondary and higher education as given by the six original categories ( $\leq 4$  years, 5–6 years,  $> 6$  years). Variables were considered to contribute significantly to the logistic regression model if  $P < 0.10$  for the Wald statistic. All statistical analyses were done using SPSS for Windows version 10.

## Results

The data on drug use in this study population are presented in Table 1. The percentage of girls reported to have used medication was about twice the percentage of boys (for prescription drugs 20.1% and 10.9%, for OTC drugs 44.8% and 23.6%).

Socio-economic status was not significantly associated with prescription drugs (linear trend,  $P = 0.204$ ). However, socio-economic status was statistically significant associated with OTC drugs (linear trend,  $P = 0.021$ ).

After stratification on gender, the association between socio-economic status and drug use appeared to depend on gender. With increasing SES the percentage of boys having used OTC drugs

increased from 6.7% to 31.4% (linear trend,  $P = 0.027$ ). No such trend was found in girls ( $P = 0.179$ ).

There appeared to be a strong relation between self-rated health and drug-use for both prescription drugs and OTC drugs (both  $P < 0.005$ ). The poorer the self-rated health, the higher the percentage of drug-use in the last 14 days. No statistically significant association could be found between socio-economic status and self-rated health (linear trend,  $P = 0.132$ ).

In the logistic regression models, the odds of drug-use was described including all covariables of interest (Table 2). In the logistic model for prescription medication, perceived health and gender contributed significantly, while SES did not ( $P = 0.45$ ). In the logistic model for OTC medication, perceived health and gender were statistically significant ( $P < 0.001$ ). SES also contributed significantly to the model ( $P = 0.07$ ), suggesting a lower socio-economic class was associated with a lower odds of having used an OTC drug. The gender–SES interaction was not included in the model ( $P = 0.43$ ). For both prescription and OTC drugs, a lower self-reported health status was associated with an increased odds for having used a drug, and the odds for girls was about twice that for boys (Table 2).

**Table 1** Data on the use of drugs and socio-economic status stratified on perceived health and gender

Self-reported health	SES	Boys (n = 736)			Girls (n = 741)		
		Used prescription drugs	Used OTC drugs	Total in stratum	Used prescription drugs	Used OTC drugs	Total in stratum
Bad/moderate	Low 1	1	0	1	1	1	3
	2	0	1	4	1	2	5
	3	0	3	8	6	13	23
	4	0	2	7	8	7	16
	5	1	2	7	5	10	14
	High 6	3	5	7	4	5	6
	Total	5	13	34	25	38	66
Good	Low 1	0	0	4	3	2	9
	2	5	7	29	11	16	48
	3	7	14	64	23	43	70
	4	12	21	68	20	47	87
	5	5	11	43	16	31	67
	High 6	3	9	22	7	20	39
	Total	32	62	230	80	159	330
Very good	Low 1	1	0	6	0	1	5
	2	5	10	32	6	11	24
	3	5	11	67	11	36	76
	4	10	18	88	7	22	62
	5	2	16	57	3	15	37
	High 6	5	8	32	2	15	27
	Total	28	63	282	29	100	231
Excellent	Low 1	0	1	4	1	1	5
	2	4	4	25	2	2	7
	3	5	6	46	3	7	23
	4	2	11	48	2	14	34
	5	2	9	42	4	7	26
	High 6	2	5	25	3	4	19
	Total	15	36	190	15	35	114

**Table 2** Multiple logistic regression results incorporating all covariables

Dependent variable	Use of prescription drugs			Use of OTC drugs		
	OR	95% CI	P (Wald)	OR	95% CI	P (Wald)
Covariable						
Gender			< 0.001			< 0.001
Boys	1			1		
Girls	1.80	1.34–2.43		2.43	1.93–3.04	
Health			< 0.001			< 0.001
Excellent	1			1		
Very good	1.09	0.68–1.74		1.48	1.06–2.06	
Good	2.02	1.30–3.13		1.86	1.34–2.57	
Bad/Moderate	3.34	1.87–5.95		2.84	1.75–4.62	
SES			0.45			0.07
Upper	1			1		
Middle	1.00	0.63–1.59		0.78	0.55–1.11	
Lower	0.83	0.53–1.32		0.67	0.47–0.95	

## Discussion

In this study, the drug-use of 15–17-year-old boys and girls in relation to their socio-economic status was analysed. An association between drug use and socio-economic status could be found only for OTC drugs. After taking gender and self-reported health into account, this association did not reach full statistical significance at the 0.05 level. Hence, our study results were not in full agreement with studies from other countries that suggest the absence of socio-economic health differences in adolescence<sup>6,7</sup>.

Of the total of 1598 15–17-year-olds who responded to the questions on drug use, 121 had missing information on socio-economic status. To investigate possible bias thus induced, we tested for associations between socio-economic status known or unknown and any of the other variables (gender, prescription drug use OTC drug use, and perceived health). No such association could be detected. Hence we conclude that the influence of bias is probably limited.

The questions on prescription and OTC drugs originated from the general health surveys of Statistics Netherlands (CBS). Statistics Netherlands is aware of interpretation problems with respect to the question on OTC drugs and drew attention to the fact that some respondents did not regard aspirin as a drug<sup>15</sup>. The difficulty with the classification in prescribed and non-prescribed drugs was that we did not know exactly how respondents interpreted this classification. For example, how did they classify a homeopathic drug recommended by a general practitioner and bought from a drugstore? What if this homeopathic drug was prescribed by the general practitioner and purchased in the community pharmacy? We think the impact of this ambiguity is probably small, because our results for prescription and OTC drugs were concordant. However, we do not know whether this ambiguity is related to socio-economic factors or gender.

No association between prescription drug use and socio-economic status could be found. Since the literature suggests that the direction of this association in the general population may differ with drug groups<sup>8–10</sup>, our results may be due to the fact that the question was too crude. On the other hand, our

results may stem from an actual lack of socio-economic health differences in Dutch adolescents.

Education has a stronger predictive value for health than income and occupation<sup>4–14</sup>. Educational level is of good use for studying socio-economic health differences in the general population but is it in adolescents? During adolescence the influence of parents reduces in many areas and the influence of the peer group increases, or at least remains significant. With this in mind, one could think of current education of the adolescent as a proxy for future socio-economic status. Since our data contained information on school levels, we performed the same analyses as reported in the Results section. School level was associated with perceived health and OTC drug use, but there was no linear trend. So one cannot say that a higher school level is associated with better self-reported health, although some studies report a health selection mechanism in educational careers<sup>5</sup>. After stratification on gender and perceived health, none of the tests for association between school level and medication were statistically significant.

We did find a strong association between drug-use and gender, despite the fact that contraceptive pills were excluded. Another Dutch study also found that more girls than boys use prescription medication<sup>15</sup>. An obvious though partial explanation for this difference between boys and girls is the association between self-reported health and gender that has been reported<sup>16,17</sup>. An additional explanation for the difference in the use of non-prescribed drugs could be that girls take OTC-available analgesics for pain relief during their menstrual period.

## Conclusion

In conclusion, this study did detect a borderline statistically significant socio-economic health difference with regard to OTC drug-use in adolescence. More detailed information on type of prescription drugs would be needed to rule out the possibility of socio-economic differences with respect to prescription medication in adolescence. There were gender differences in adolescence with respect to prescription drugs use and OTC drugs that could not be accounted for by perceived health and socio-economic status.

## Acknowledgement

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